

# Rhode Island Department of Transportation

## Roundabouts

# Benefits of Roundabouts

- ✓ Safest At-Grade Intersection Possible
- ✓ High Capacity/Low Delay
- ✓ Good for All Modes of Traffic
- ✓ Reduce Vehicle Emissions
- ✓ Geometric Flexibility
- ✓ Aesthetics

# Roundabout vs. Traffic Circles

	Modern Roundabouts	Traffic Circles (Rotaries)
Size	150' to 230' 2-lane roundabout	600' or more
Circulatory speed	15 to 25 mph	30 to 35 mph
Deflection at entry	Sharper curve at entry	Smoother curve or no deflection

# Roundabout vs. Traffic Circles

	<b>Modern Roundabouts</b>	<b>Traffic Circles (Rotaries)</b>
<b>Traffic Control</b>	Yield Control	Stop Control
<b>Right of Way</b>	Vehicles in the Roundabout	Vehicles Entering the Circle
<b>Pedestrian Access</b>	Never in the Center Island	Allow Pedestrians in the Center Island
<b>Direction of Circulation</b>	Counterclockwise around the Center Island	Counterclockwise or Clockwise

# Roundabout vs. Traffic Circles

Old Traffic Circle



Modern Roundabout



# Roundabout vs. Traffic Circles

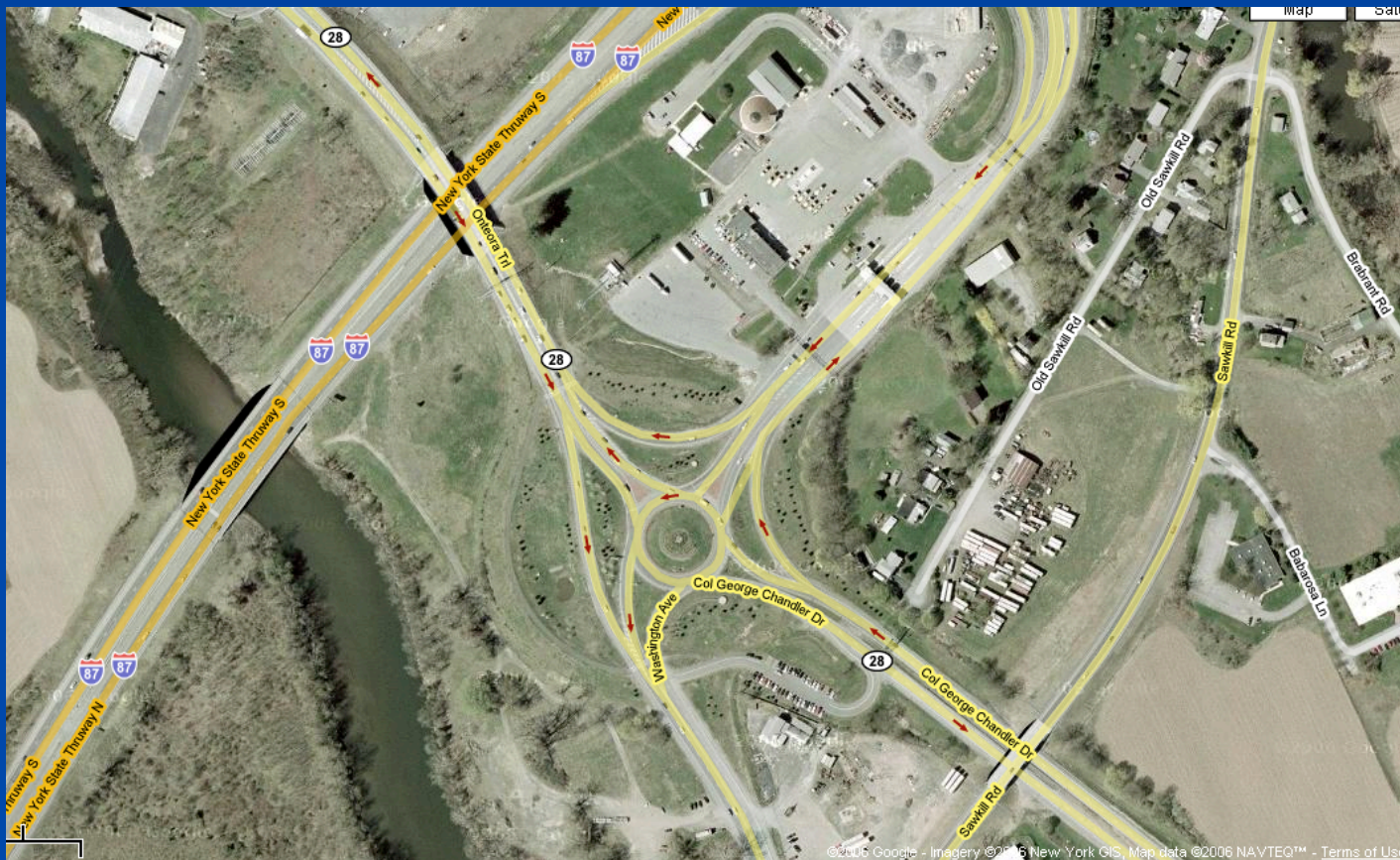
Kingston, NY





# Roundabout vs. Traffic Circles

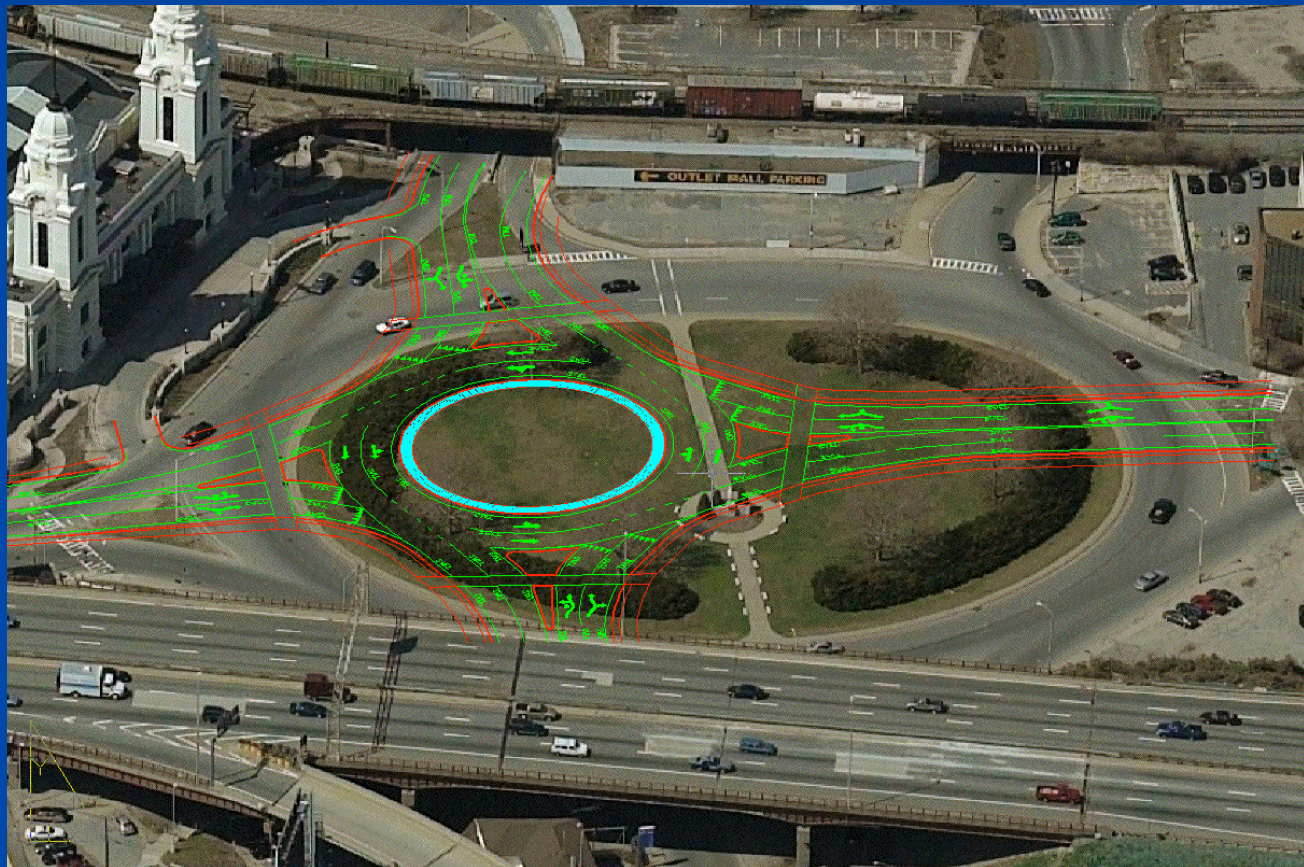
Kingston, NY





# Roundabout vs. Traffic Circles

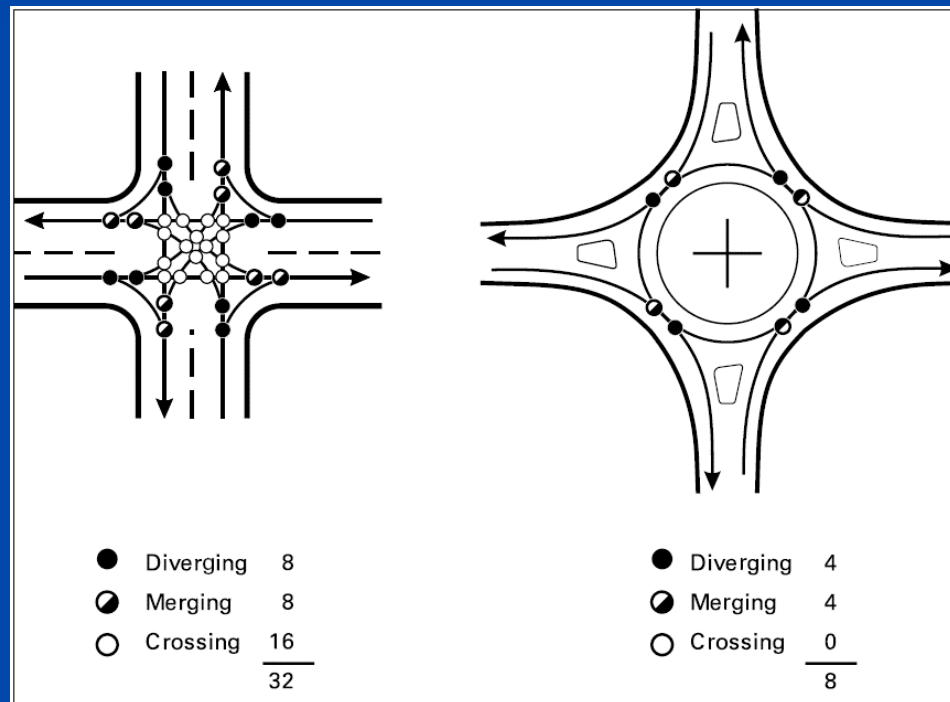
Washington Square  
Worcester, MA





# Roundabout vs. Signalized Intersections

Reduce points of conflict from 32 to 8 compared with a traditional intersection



# Roundabout vs. Signalized Intersections

Before  
Signalized Intersection



After  
Roundabout



Asheville, North Carolina

# Reduce number and severity of accidents

2001 study by the Insurance Institute for Highway Safety showed that:

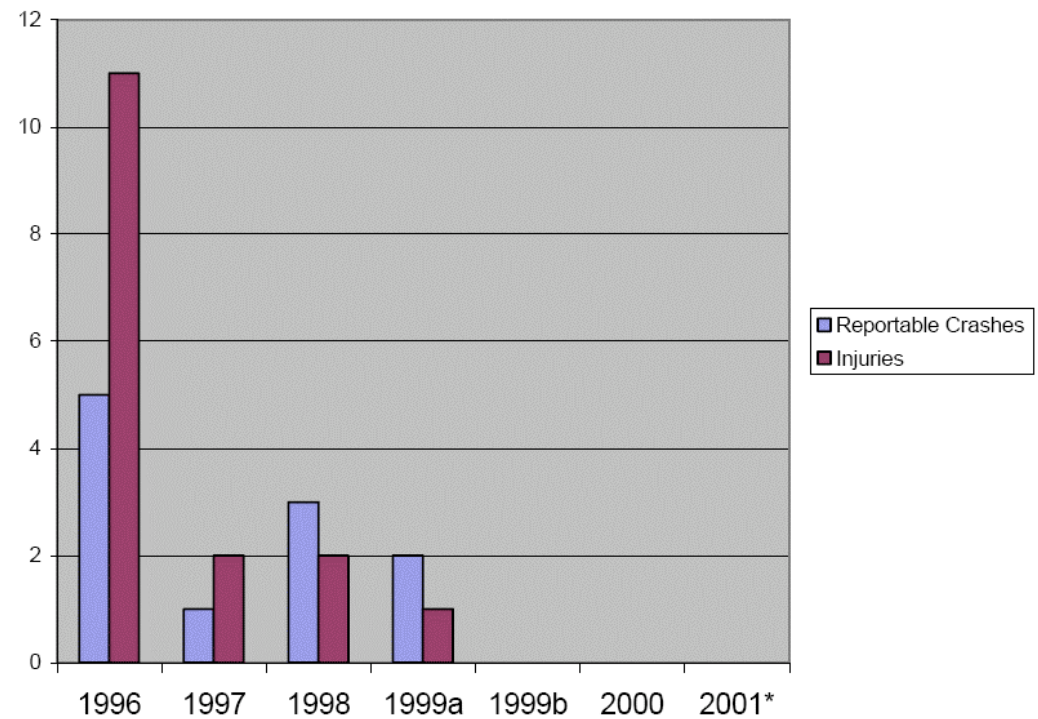
- ✓ 24 intersections in the US converted from signal or stop control to roundabout
- ✓ Reduced number of crashes by 39 %
- ✓ Reduced number of injury crashes by 76 %
- ✓ Reduced fatal or incapacitating crashes by 90 %



# Reduce number and severity of accidents

Lineville Road &  
Cardinal Lane,  
Howard WI

Figure 2: Reportable Crashes and Injuries at the Lineville Road/Cardinal Lane Intersection (1996 - 2001)



# Reduce Vehicle Delays

2004 study in Kansas showed that:

- ✓ 11 state intersections converted from signal or stop control to roundabout
- ✓ Reduced average vehicle delay by 65 %
- ✓ Reduced average of vehicle stops by 52 %

Russell, E.R.; Mandavilli, S.; and Rys, M.J. 2004. Operational performance of Kansas roundabouts: phase II. Report no. K-TRAN KSU-02-04, Final Report 01-04. Manhattan, KS: Kansas State University, Department of Civil Engineering.

# Accommodate larger vehicles

- ✓ Geometry provides a Truck Apron
- ✓ Vehicles with large turning radii such as buses, trucks, tractor trailers



# Reduce Vehicle Emissions and Fuel Consumption

2004 study of roundabouts across the US:

- ✓ Reduced Carbon Monoxide Emissions by 32 %
- ✓ Reduced Nitrous Oxide Emissions by 34 %
- ✓ Reduced Carbon Dioxide Emissions by 37 %
- ✓ Reduced Hydrocarbon Emissions by 42 %

Mandavilli, S.; Russell, E.R.; and Rys, M. 2004. Modern roundabouts in United States: an efficient intersection alternative for reducing vehicular emissions. Poster presentation at the 83rd Annual Meeting of the Transportation Research Board, Washington DC.

# Reduce Vehicle Emissions and Fuel Consumption

- ✓ Study of 10 intersections in Virginia showed that consumption was reduced on more than 200,000 gallons of fuel per year \*
- ✓ Study on the US showed that fuel consumption was reduced by about 30 % \*\*

\* Bergh, C.; Retting, R.A.; and Myers, E.J. 2005. Continued reliance on traffic signals: the cost of missed opportunities to improve traffic flow and safety at urban intersections. Arlington, VA: Insurance Institute for Highway Safety.

\*\* Várhelyi, A. 2002. The effects of small roundabouts on emissions and fuel consumption: a case study. Transportation Research Part D: Transport and Environment 7:65-71.

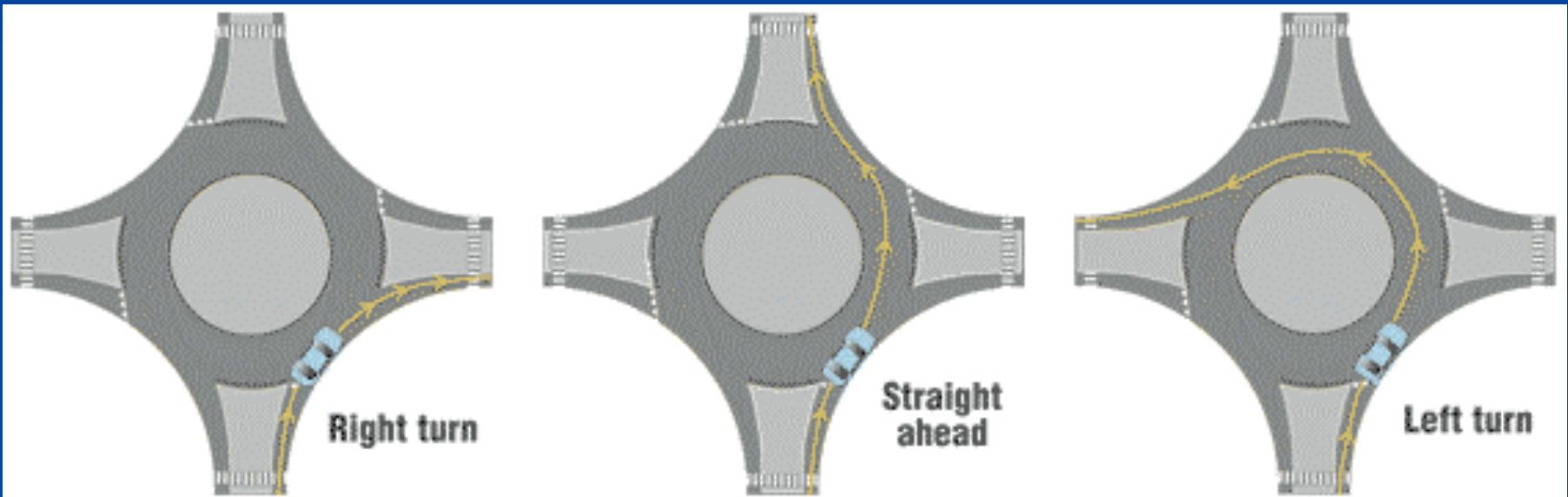
# Enhance the aesthetics

- ✓ City of Golden CO,  
South Golden Road  
Corridor
- ✓ Replaced signals with  
roundabouts





# Driving on a Roundabout



Common traffic maneuvers at roundabouts

# Modern Roundabouts

Fairbanks, Alaska



# Modern Roundabouts

Kingston, NY  
NY 28 @ I-87





# Conclusions

## Roundabouts:

- ✓ Increase Safety
- ✓ Reduce Vehicle Speed
- ✓ Fit all Kind of Vehicles
- ✓ Reduce Congestion and Vehicle Emissions
- ✓ Aesthetics